Space Weather Forecast

Issued on Monday, 05 February 2024 at 01:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares likely throughout, with a slight chance of Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with numerous Moderate-class flares observed in the past 24 hours, most of which have originated from the largest sunspot region, which is located near the southeast limb. There are currently eight sunspot regions on the Earth-facing disc. The largest and most magnetically complex is the region close to the southeast limb, although remains difficult to analyse due to its current location. Another noteworthy sunspot resides in the southwest, which is also magnetically complex. Both of these sunspots have produced Moderate-class flares in the past 24 hours. All other spots have remained fairly stable or have decreased in size. No Earth-directed have been observed in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds started the period at background levels, before increasing to reach slightly elevated levels, between 400-450km/s. Solar winds have since declined back to slow-ambient levels. The magnetic field was weak to moderate, with the important north-south component also weak to moderate. This may be due to a glancing blow from a CME, or interaction with a weak coronal hole fast wind, but this is still uncertain. The net result of the above solar wind measures was provisionally Quiet to Unsettled geomagnetic activity throughout, with an Unsettled interval observed at 04/2100-0000 UTC.

Energetic Particles / Solar Radiation: Solar radiation levels have returned to background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Overall activity is most likely to be Moderate, with isolated Moderate flares likely and a slight chance of a Strong flare, most likely from the complex region in the southwest, or the large sunspot region close to the southeast limb at present.

Solar Wind / Geomagnetic Activity: A CME that left the Sun on 01 Feb may have delivered a glancing blow earlier on 04 Feb, around 04/1010 UTC, with perhaps an interaction with a weak coronal hole fast wind, although this is still uncertain. Solar winds did reach slightly elevated levels on 04 Feb, before declining to background levels. Solar winds should remain at mostly background levels throughout the period as no further enhancements are currently featured in the forecast. Geomagnetic activity should be mostly Quiet throughout the period, although there remains a slight chance of Unsettled or Active early on day 1 (05 Feb) due to waning effects of either the glancing CME, or a weak coronal hole fast wind.

Energetic Particles / Solar Radiation: High energy proton flux is expected to remain below the S1/Minor Radiation Storm level, with a daily slight chance of exceeding the S1 threshold during the period.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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